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THE EQUITY RISK PREMIUM: A SOLUTION?

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In our 1985 equity premium puzzle paper, we argued that standard competitive theory, sensibly restricted, cannot account for both the 0.8 percent average real return on debt and the nearly 7.0 percent average real return on equity that the U.S. data show for the 1889-1978 period. In these comments, we explain why the Reitz (1988) theory is not a solution to this puzzle and in the process clarify what we think would and would not be a solution.

In our earlier paper, we did not argue that competitive theory restricted in a sensible way will never account for the now-puzzling return observations. Perhaps the introduction of some other preference structure will do the job. Recent examples of explorations of alternative preference structures include dropping the expected utility assumption [Epstein and Zin (1987), Kocherlakota (1987), and Weil (1987)] and introducing habit formation [Constantinides (1987)]. For such efforts to be successful, though, they must convince the profession that the proposed alternative preference structure is more useful than the now-standard one for organizing and interpreting not only these observations on average asset returns, but also other observations in growth theory, business cycle theory, labor market behavior, and so on. Anyone accomplishing that would have contributed significantly to economic science.

A Problematic "Solution"

Reitz (1988), however, uses standard preference structures and has not introduced technological features that produce monetary arrangements. He finds that if the probability of a very large drop in consumption is small and if the intertemporal substitution elasticity of consumption is low, then a risk-free real bill will have a much lower average yield than a security that has dividends proportional to consumption. We do not challenge this fact. We do, though, challenge Reitz's conclusion that this fact resolves the equity premium puzzle within the standard theoretical framework that abstracts from monetary factors, among other things.

In Reitz's examples, the smallest annual decline in consumption is 25 percent and the largest over 98 percent. Declines of this magnitude have not been experienced in the United States. During the last 100 years, a period that includes the Great Depression, consumption has fallen more than 5 percent in a year only four times. And the largest of those four declines was only 8.8 percent. But even if we assume that people perceive the possibility of a consumption decline as large as Reitz postulates, his proposed solution has two serious--indeed, fatal--problems.

Unreasonable Equations . . .

Is equating the real return on a nominal Treasury bill with that on a real bill reasonable? It is only if unanticipated inflation is small. Under much less trying conditions than those proposed by Reitz, governments have expropriated much of the real value of nominal debt by the mechanisms of unanticipated inflation. We cite three examples. During the German hyperinflation, holders of bonds denominated in Reich marks lost virtually all of the value invested in these assets. During the 1920s Poincaré administration in France, bondholders lost nearly 90 percent of the value invested in nominal debt). And in the 1980s Mexican holders of dollar-denominated debt lost a sizable fraction of its value when the Mexican government, in a period of rapid inflation, converted the debt to pesos and limited the rate at which these funds could be withdrawn.

In present-day fiat monetary systems, governments in times of crisis can (and probably will) default at least partially on the nominal debt they have issued. This may not have been possible when governments issued gold bonds. If the average real return on debt was lower in those times than in the fiat money era, Rietz's argument would have some support. But this is not true. The average real return on debt was approximately the same in 1889-1932 as it has been since.

. . . And Parameter Values

Is Rietz's risk aversion parameter a reasonable size? We don't think so. In his example with a 1-in-100 chance of a 25 percent decline in consumption, the required risk aversion parameter is 10. This is a large value, far larger than that used in virtually all applied general equilibrium studies. Such a large value for the curvature parameters is also inconsistent with the value Hansen and Singleton (1983) found was necessary to rationalize the postwar stock returns and consumption in the United States: that value is near 1.0. Using one value of the curvature parameter to account for one feature of the data and another value to account for some other feature is, to say the least, not the best scientific practice.

Needed: Historical Support

Additional historical evidence in support of Reitz's hypothesis is needed for it to be taken seriously. Perhaps the implication of the Reitz theory that the real interest rate and the probability of the extreme event move inversely would be useful in rationalizing movements in the real interest rate during the last 100 years. For example, the perceived probability of a recurrence of a depression was probably high just after World War II and then declined. If real interest rates rose significantly as the war years receded, that would support the Reitz hypothesis. But they did not. While they were lower before the Treasury Accord than after it, this is surely related to the Fed's actions to support the price of government debt as it had said it would.

Similarly, if the low-probability event precipitating the large decline in consumption were a nuclear war, the perceived probability of such an event surely has varied in the last 100 years. It must have been low before 1945, the first and only year the atom bomb was used. And it must have been higher before the Cuban Missile Crisis than after it.[2] If real interest rates moved as predicted, that would support Reitz's disaster scenario. But again, they did not. The point is that to determine how useful this theory is, we must identify the possibly small-probability events and try to measure the magnitudes of their probability over time.[3]

History suggests, however, that efforts might be more productively put into incorporating monetary factors into standard theory. For example, real returns on short-term debt were high on average in both the 1890s and the 1980s. Was the perceived probability of a disaster low in these periods, as Rietz's theory requires? An alternative interpretation of their relatively high real returns is the contemporary monetary policies pursued. In the 1890s, the United States was on a gold standard, and because of gold supply conditions, the relative price of gold increased. This produced deflation and a credit crisis. The high real returns in the 1980s might better be attributed to the policies of the Fed under the leadership of Paul Volcker than to a decrease in the probability of a 25 or 50 percent drop in consumption. This strongly suggests that the average return on short-term debt is not invariant to monetary arrangements.

Conclusion

Are Rietz's disaster scenarios reasonable? They are undoubtedly extreme. That such extreme assumptions are needed to account for the average returns on debt and equity we interpret as supporting our contention that standard theory still faces an unsolved puzzle.

Notes

[*] We thank Rudiger Dornbusch, Stanley Fischer, Lars Hansen, and Lawrence Summers for helpful discussions. Needless to say, the views expressed are our own.

[1] Hansen and Singleton (1983) also estimate this curvature parameter using Treasury bill returns as well, and they again obtain a value near 1. But given the failure of standard theory to account for Treasury bill returns, this is not an estimate that should be used to restrict theory.

[2] Lawrence Summers suggested that the Cuban Missile Crisis should be a useful historical event to assess the usefulness of the Rietz theory for studying asset returns.

[3] In Rietz's example 3, where the existence of a risk premium consistent with observation and reasonable risk aversion is demonstrated, consumption drops 98.2 percent in one year. We suggest that a 99 percent drop in consumption with a small associated probability can give the same risk premium with a lower risk aversion parameter.

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